

[002] This application is a national stage completion of PCT/EP2003/011496 filed on October 16, 2003 which claims priority from German Application Serial no. 102 50 662.0 filed October 31, 2002.

[003] FIELD OF THE INVENTION

[005] BACKGROUND OF THE INVENTION

[015] SUMMARY OF THE INVENTION

< [030] ~~Claim 37 reveals a particularly advantageous V-belt for use in the apparatus according to the invention. BRIEF DESCRIPTION OF THE DRAWINGS~~

< [031] In the drawings:

[050] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

1-38. (CANCELED)

39. (NEW) An apparatus for machining a metallic workpiece in strip or plate form, in particular for removing an oxide layer from a cut surface or cut edge of the workpiece, wherein a revolving conveyor device (2) is provided with at least one brush (3), the conveyor device (2) guides the at least one brush (3) at least approximately linearly past the region of the workpiece (1) that is to be machined, obliquely or transversely with respect to a direction of advance of the workpiece (1).

40. (NEW) The apparatus according to claim 39, wherein the conveyor device (2) is arranged in a standing position, so that the at least one brush (3) runs substantially vertically in a region of the workpiece (1), or in a lying position, so that the at least one brush (3) runs substantially horizontally in the region of the workpiece (1).

41. (NEW) The apparatus according to claim 39, wherein two conveyor devices (2) are provided between which the workpiece (1) can be guided obliquely or transversely with respect to the direction of rotation of the conveyor device (2), in such a manner that each conveyor device (2) machines one of two main surfaces (1c) of the workpiece (1) by the associated brushes (3).

42. (NEW) The apparatus according to claim 41, wherein the direction of rotation of the conveyor devices (2) is selected such that the brushes (3) of the two conveyor devices (2) can be guided past the main surfaces (1c) of the workpiece (1) in the same direction.

43. (NEW) The apparatus according to claim 40, wherein the direction of rotation of the conveyor device (2) arranged in a standing position is selected such that the at least one brush (3) can be guided past the workpiece (1) in the direction of a base plate (9), or from the top downward.

44. (NEW) The apparatus according to claim 40, wherein the direction of rotation of the conveyor device (2) arranged in a lying position is selected such that the at least one brush (3) can be guided along the workpiece (1) in the direction of a delimiting plate which guides the workpiece (1) at one end side.

45. (NEW) The apparatus according to claim 39, wherein four conveyor devices (2) are provided such that, in each case, two oppositely rotating conveyor devices (2) machine one main surface (1c) of the workpiece (1).

46. (NEW) The apparatus according to claim 39, wherein the conveyor devices (2) are arranged slightly offset, preferably by 10 to 100 mm, with respect to one another in the direction in which the workpiece (1) passes through.

47. (NEW) The apparatus according to claim 45, wherein an arrangement of four conveyor devices (2), the direction of rotation of the first conveyor device (2) and the fourth conveyor device (2), as seen in the direction in which the workpiece (1) passes through, is selected such that the brushes (3) can be guided past the workpiece (1) in the direction of the base plate (9) or the delimiting plate.

48. (NEW) The apparatus according to claim 39, wherein the at least one conveyor device (2) has a plurality of brushes (3) arranged at a spacing distance from one another.

49. (NEW) The apparatus according to claim 39, wherein there is a guide passage (4), which can be set to the thickness of the workpiece (1) and by means of which the workpiece (1) can be displaced with a guidance transversely with respect to the direction of rotation of the at least one guide device (2).

50. (NEW) The apparatus according to claim 41, wherein the conveyor devices (2) can be displaced or adjusted with respect to one another so as to correct for wear of the at least one brush (3).

51. (NEW) The apparatus according to claim 39, wherein bristles (12) of the brush (3) have a wavy and/or twisted profile.

52. (NEW) The apparatus according to claim 39, wherein bristles (12) of the brush (3) are formed as one of intertwined bristles and abrasive bristles.

53. (NEW) The apparatus according to claim 39, wherein bristles (12) of the brush (3) are inclined by up to 45° in the direction of rotation.

54. (NEW) The apparatus according to claim 51, wherein the brush (3) is provided with supporting bristles (20) for supporting and stabilizing bristles (12) of the brush (3).

55. (NEW) The apparatus according to claim 52, wherein in each case a bundle (120) of bristles (12) is surrounded by a stabilizing and supporting sheath (21).

56. (NEW) The apparatus according to claim 39, wherein the brush (3) or bristles (12) of the brush (3) is one of adhesively bonded, molded, screwed, stamped or welded to the respective conveyor device (2).

57. (NEW) The apparatus according to claim 39, wherein the rotational speed of the brush (3) is between 5 to 30 m/sec.

58. (NEW) The apparatus according to claim 39, wherein each conveyor device (2) has an independent drive.

59. (NEW) The apparatus according to claim 39, wherein the conveyor device (2) is provided with one of a V-belt (13), a toothed belt, a flat belt with studs and a chain.

60. (NEW) The apparatus according to claim 39, wherein the conveyor device (2) is a triple V-belt (13a, 13b, 13c), with a middle V-belt (13a) accommodating the brushes (3).

61. (NEW) The apparatus according to claim 59, wherein the V-belt (13) is formed from at least one of rubber, plastic, synthetic rubber and neoprene.

62. (NEW) The apparatus according to claim 59, wherein a PU covering layer (14) is applied to the V-belt (13), and a carrier (15), which is preferably formed from rubber or plastic, for the brush (3) or bristles (12) of the brush (3) is welded onto the PU covering layer (14).

63. (NEW) The apparatus according to claim 59, wherein a carrier (15), which is preferably formed from rubber or plastic, for the brush (3) or bristles (12) of the brush (3) is one of screwed, riveted, adhesively bonded, welded or clipped onto the V-belt (13).

64. (NEW) The apparatus according to claim 63, wherein the V-belt (13), on a top side intended for connection to the carrier (15), has elevations or protuberances (17) for one of guiding and supporting the carrier.

65. (NEW) The apparatus according to claim 62, wherein the bristles (12) are shot into the carrier (15) in bundles (120).

66. (NEW) The apparatus according to claim 62, wherein the carrier (15), transversely with respect to the direction of rotation of the conveyor device (2), has slots (16) or is formed from individual segments (15b), the segments (15b) or the pieces (15a) formed by the slots (16) having a length of from 10 to 40 mm

67. (NEW) The apparatus according to claim 66, wherein the segments (15b) each have a groove (18) at one end and a tongue (19) at the other end, by means of which the segments (15b) can be connected to one another.

68. (NEW) The apparatus according to claim 66, wherein in each case between two to four adjacent segments (15b) or pieces (15a) are provided with bristles (12) and together form a brush (3).

69. (NEW) The apparatus according to claim 68, wherein between one to three bristle-free segments (15b) or pieces (15a) are arranged between the brushes (3) of a V-belt (13).

70. (NEW) The apparatus according to claim 66, wherein the pieces (15a) or segments (15b) are arranged at a distance from one another or in free-standing form, with the distance being 3 to 20 mm.

71. (NEW) The apparatus as claimed claim 39, wherein a resistance element (23) is arranged downstream of a diversion point (22) of the conveyor device (2), as seen in the direction of rotation, before one of the brush (3) or bristles (12) comes back into contact with the metallic workpiece (1) in strip or plate form.

72. (NEW) The apparatus according to claim 71, wherein the resistance element (23) is arranged in the region in which the brush (3) or its bristles (12) leave the circular path produced by the diversion point (22) of the conveyor device (2) and merge(s) into a linear or rectilinear movement.

73. (NEW) The apparatus according to claim 71, wherein the resistance element (23) one of mechanically and prevents the bristles (12) from yielding in the direction of rotation.

74. (NEW) The apparatus according to claim 73, wherein the steel roll (23) can be introduced into the path of the brush (3) or bristles (12) such that tips of the bristles (12) butt against it.

75. (NEW) A V-belt for use in the apparatus according to claim 39, wherein bristles (12) which are one of adhesively bonded, molded, screwed, stamped or welded onto a top side, either directly or via a carrier, the bristles (12) being inclined by up to 45° in the direction of rotation.

76. (NEW) A method for machining a metallic workpiece in strip or plate form, in particular for removing the oxide layer from a cut surface or cut edge of the workpiece, wherein a rotating conveyor device (2) which is provided with at least one brush (3) operated such that the at least one brush (3) runs at least approximately linearly in a region corresponding to the dimensions of the workpiece (1), and the

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workpiece (1) is guided past obliquely or transversely with respect to the direction of rotation of the conveyor device (2), making contact with the brush (3).